

REMARKS

Claims 2, 16, 19 and 20 are all the claims pending in the application. Support for the amendment to claim 2 may be found in prior pending claim 17 and at page 5, lines 13-15, and page 4, lines 4-5. Support for new claim 19 may be found in the specification as originally filed, for example, at page 6, lines 16-20 and in Example 2 on pages 9-10, which sets forth 100 parts by weight of natural rubber. Support for new claim 20 may be found in the specification as originally filed, for example, at page 7, lines 6-8, and Example 2 on pages 9-10, which sets forth 2.0 parts by weight of cobalt naphthenate.

The presently claimed invention is recites the following elements (A) to (C):

- (A): A reinforcing member constitutes at least one of a carcass ply and a belt ply of a truck tire, a bus tire and an off-road tire, and the reinforcing member (A) comprises the following (B) and (C);
- (B): A composite layer comprising a coating rubber composition and steel cords; and
- (C): A squeegee rubber composition which adjoins to the composite layer and contains a hydrotalcite in an amount of 0.1 to 20 parts by weight based on 100 parts by weight the rubber component of the squeegee rubber composition.

An object of the present invention is to provide a tire reinforcing member capable of greatly improving the endurance of a pneumatic tire by exceedingly enhancing the resistance to loss of the steel cord-to coating rubber adhesion without affecting the initial adhesion.

Applicants respectfully submit that the present invention is not anticipated by or obvious over the disclosures of Hashimoto in view of Fukuhara (JP2000-17115), alone or further in view

of Kobayashi, Nosu and "Admitted Prior Art", and request that the Examiner reconsider and withdraw these rejections in view of the following remarks.

Hashimoto discloses a silicone-rubber composition which is excellent in destruction strength water-resistance, heat-conductivity and processing property and which is used as side rubber adjoining to the carcass rubber as shown in Fig. 1 and Fig 2.

As a tire-size, Hashimoto discloses 165 SR 13. However, this tire size is the size of a radial tire for use in passenger cars, which are different from truck, bus, and off-road tire, which are recited in the above-element (A). For such tires, mainly polyester or rayon fiber are used for the types of cords used for the carcass, including at the time Hashimoto was filed. To the contrary, the cords for the composite of the present invention are steel, as recited in the claimed above-element B. The method for adhesion of steel cords is entirely different from that in case of organic fibers. This is explained in further detail below.

In connection therewith, the Examiner cites the teaching of disposition of the side rubber (equals to the squeegee rubber) containing an organic filler adjoining to the carcass ply and alleges that would lead one skilled in the art to conclude that the present invention is obvious from the reference, as being easily imaginable irrespective of whether the carcass cords are an organic fiber or steel (and as to the choice of hydrotalcite as the organic filler). Applicants respectfully submit that the resistance to loss of the organic cord-to-coating rubber adhesion without affecting the initial adhesion is unexpectedly enhanced by compounding hydrotalcite in the side rubber. Applicants further note that there is nothing at all in the cited art to teach or suggest such adhesion or that such adhesion the steel cord-to-coating rubber may be attained.

The Examiner also indicates that the reference discloses hydrotalcite to be used as a filler. However, hydrotalcite only one of a great number of examples of inorganic fillers, short-fibers and resins. Accordingly, it is respectfully submitted that the reference does disclose or suggest the present invention.

As to Method for Adhesion of Rubber and Cords:

1. The adhesion of steel cords and the coating rubber in the present invention:

As to the adhesion of steel cords and the coating rubber in the present invention, the adhesion can be effected by the reaction-product of “Cu_xS”, which is obtained by the reaction of Copper contained in the brass plating (Cu-Zn alloy) of the steel cord with sulfur contained in the coating rubber composition. Further, a metal salt, in particular Cobalt salt of an organic acid is used as an adhesion-accelerator. See the instant Specification, from page 6, line 14 through page 7 line 20.

2. The adhesion of the organic fiber cords (Polyester fiber: Polyesthylene terophthalate) and the coating rubber:

The radial tire (165 SR 13) for passenger cars as disclosed in the reference uses mainly polyester fiber as the carcass cords. Thus, Applicants’ comments are directed to the use of polyester cords as the carcass cords. Since the polyester fiber, as is, gives hardly any adhesion property to rubber, it is necessary to diffuse an adhesive component in to the polyester fibers and to perform adhesive power, by subjecting the polyester fiber to the adhesive treatment, i.e., the heat treatment after dipping. As the adhesive, an adhesive liquid, which is obtained by modifying a RFI liquid comprising an early stage condensate of resorcine formaldehyde and

rubber latex, so as to become usable for the polyester fiber, is used. (See, for example, USP4,596,854 and USP5, 075,415 (listed in the Information Disclosures Statement (IDS) filed concurrently herewith).

As briefly mentioned above, there is a clear distinct difference between the method for adhesion of the organic cords, representative of the reference, and the adhesion methods for use with steel cords. Accordingly, Applicants submit that it would have been impossible for one skilled in the art, from the teachings of the cited art, to predict or expect the results as are obtained in the present invention (the keeping of the initial adhesion and improvement of the resistance to loss of the polyester cord-to-coating rubber adhesion and the coating rubber in case when hydrotalcite is compounded in the side-rubber (Squeegee rubber)).

As to the Squeegee Rubber;

With respect to the squeegee rubber, a number of patent applications filed by the present inventors have been laid open, for example, Japanese Patent Application Laid Open Nos. Heisei 4-100703 (abstract attached in the IDS), Heisei-10-35217 and Heisei-10-297209 (abstracts and English language translations attached in the IDS). Of these laid open patent applications, No. Heisei-10-297209 describes in item [0002] of Description of the Prior Art, line 3 to 4, that ...the squeegee rubber layer (henceforth an inner surface protective layer)... . Thus, it is apparent that the squeegee rubber is usually used as an inner material for tire, which corresponds to 6_a and 6_b denoted in Figure shown in the English translated Abstract of the laid open No. Heisei-10-297209 (Attached in the IDS).

In the present invention, the squeegee rubber is disposed as an inner protective layer, adjoining to the composite layer of the coating rubber and the steel cords. However, it is incorporated in order to improve the resistance to loss of the steel cord-to-coating rubber adhesion without affecting the initial adhesion. This is aimed at the above-mentioned purpose and is different from the side rubber. Specifically, the squeegee rubber layer of the present invention is a thin layer denoted as 3 shown Fig. 1a to Fig. 1c, and for Example, the side rubber is disposed on the squeegee rubber layer 3, when the composite layer 4 shown in Fig. 1a is carcass ply.

Moreover, even if the cited references are combined, it is respectfully submitted that it would not have been obvious to one of ordinary skill in the art to select the claimed reinforced with a tire reinforcing member comprising.. Thus, even if the cited references are combined, it is respectfully submitted that the present invention, and the results achieved therewith, would not have been obvious to one of ordinary skill in the art.

As to the rejections further in view of Kobayashi, Nosu and "Admitted Prior Art", Applicants respectfully submit that the Examiner has merely alleged that the claimed hydrotalcite exist or are is available for purchase. The Examiner has not established that such hydrotalcites are known to be used in the tire art or are known to be used as reinforcing members for tires.

Kobayashi relates to the use of hydrotalcites to stabilize halogen-containing acrylic rubbers. Nosu relates to the use of hydrotalcites to stabilize halogen-containing rubber compositions. The “admitted prior art” merely indicates a source for purchasing hydrotalcites. None of the secondary references relate to the tire art.

Additionally, the Examiner has not set forth why one skilled in the art would combine the teachings of the secondary references with the rubber compositions as disclosed in Hashimoto and Fukuhara. That is, the Examiner has not set forth any “motivation” to use the hydrotalcites of the secondary references with the compositions of the primary references.

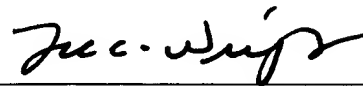
For the above reasons, it is respectfully submitted that the subject matter of claims 2, 16, 19 and 20 is neither taught by nor made obvious from the disclosures of Hashimoto and Fukuhara, either alone or in combination with Kobayashi, Nosu and “Admitted Prior Art”, and it is requested that the rejections under 35 U.S.C. §103(a) be reconsidered and withdrawn.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. Application No. 09/832,825

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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CUSTOMER NUMBER

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